EFFECT OF PAWANMUKTASANA SERIES ON SELECTED PHYSICAL PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES OF ELDERLY PEOPLE AT OLD AGE HOME GWALIOR

SYNOPSIS

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Certificate

I hereby declare that the synopsis titled **"EFFECT OF PAWANMUKTASANA SERIES ON SELECTED PHYSICAL PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES OF ELDERLY PEOPLE AT OLD AGE HOME GWALIOR"** is being submitted in partial fulfillment of the requirement for the degree of **Doctor of Philosophy** in **Yogic Science** under the **Department of Yogic Sciences**, **Lakshmibai National Institute of Physical Education**, Gwalior - 474002, during the academic year 2022–2023.

It is a Bonafide record of original work carried out under the supervision of **Dr. Nibu R. Krishna** (Associate Professor, Department of Yogic Sciences, LNIPE, Gwalior, M.P.) and co-supervision of **Dr. Pawan Kumar** (Assistant Professor, MDNIY, New Delhi), and has not been submitted in full or part to any other university or institute for a degree or diploma.

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ABSTRACT

The **Pawanmuktasana Series** is an effective set of yogic practices known to enhance physical mobility, physiological functions, and mental well-being. This study is designed to assess the impact of the Pawanmuktasana Series on selected physical variables e.g., range of motion, balance, proprioception, coordination, and lumbar flexion, physiological variables such as blood pressure, oxygen saturation, and forced vital capacity, and old-age adjustment variables among elderly people residing at an old age home in Gwalior. A total of 60 elderly males and females aged 50–65 years will be selected from an old-age home and randomly divided into experimental and control groups. The experimental group will undergo a 12-week Pawanmuktasana training program, three sessions per week, while the control group will not receive any intervention.

The expected outcome of this study is a significant improvement in all selected physical, physiological, and psychological variables in the experimental group compared to the control group, thus demonstrating the holistic therapeutic benefits of the Pawanmuktasana Series for the elderly population.

KEYWORDS: Pawanmuktasana Series, Elderly, Physical Variables, Physiological Variables, Psychological Variables, Old-age Home, Old age Adjustment.

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CHAPTER 1 (INTRODUCTION)

Forms and many practice components (Schmid, Van Puymbroeck, & Koceja, 2010), including breathing regulation and meditation. Yoga is classified into six styles: Jnana yoga, Karma yoga, Bhakti yoga, Mantra yoga, Raja yoga, and Hatha yoga (Doria et al., 2015). Jnana Yoga is defined as an ancient Indian practice (Ernst, Pittler, Wider, & Boddy, 2008), characterised by its diverse yoga is referred to as the yoga of knowledge and primarily focuses on the integration of the mind and body.

Yogeshwar (1994) describes philosophical practice. Karma yoga, on the other hand, is described as an unattached discipline that demands one to conduct labour without any motivation. Bhakti yoga is a form of devotion that requires the practitioner to do numerous rituals. Raja yoga is a psychological technique of yoga that helps people enhance their mental attention. Mantra yoga practice entails reciting and repeating words for a set period. Finally, Hatha yoga focuses on asana (yoga postures), pranayama (breathing practices), and Dhyana (meditation).

According to hath yoga, pawanmuktasana is classified into three series: **pawanmuktasana series 1, pawanmuktasana series 2, and pawanmuktasana series 3.**

The Pawanmuktasana Series is one of the most significant practices that is extremely beneficial in bringing tranquilly to the human body and mind. It is one of the most essential approaches used to treat patients from various sectors, etc. The Pawanmuktasana asana sequence is designed to improve awareness of the body's motions and allow for subtle impacts of the practice. Pawanmuktasana Series opens all the body's main joints and relaxes the muscles (Brown M, Rose DJ, 2005).

As the average lifespan in the contemporary period increases, so does the number of elderly people. India is still on track to become the world's second biggest country in terms of elderly population. Not only is the elderly population growing, but so are the psychological and physiological challenges that they face. The notion of an old-age home is gaining popularity in India. However, the Indian elderly maintain a traditional idea of family. However, many of them are now obligated to reside in old-age facilities. Are they satisfied with their current living

situation? Do they feel lonely or insecure? The current study attempts to determine the answers to these issues. There are two groups: Males of various ages will be recruited for the research using a random sample approach. Aging is a natural, unavoidable biological occurrence. The senior population on the globe is growing. The world's population is predicted to exceed 830 million by 2025.

People who are below and above 60. Developing nations, such as China and India, have the biggest overall populations and will continue to have the highest absolute numbers of old people. The senior population's psychological state is not excellent. Depression and suicide are becoming increasingly common in older persons. Older folks are getting increasingly sad and committing suicide at a higher rate than ever before as their physical and mental health deteriorate. According to official suicide data, elderly persons are at increased risk.

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Loneliness is a subjective, bad sensation caused by the individual's own experience with poor social relationships. Two causal theories can explain the factors that influence loneliness and old age adjustment. The first model investigates external variables that are lacking in the social network as the source of loneliness, whereas the second model investigates internal aspects such as personality and psychological issues. Loneliness can have major health repercussions. It is one of the three major causes of depression, according to Green (1992).

According to Hansson et al. (1986-87), loneliness is associated with poor psychological adjustment, as well as dissatisfaction with family and social relationships. As humans age, they endure age-related losses. These losses prevent a person from sustaining or obtaining new, desirable relationships, which leads to loneliness. The elderly experience loneliness because of living alone, a loss of family relationships, a diminished connection with their culture of origin, and an inability to actively participate in communal activities. All these issues are common among the elderly who live in our country's old-age homes.

Following the above-mentioned literature survey and analysis, a research need was identified to investigate the nature of loneliness and old age adjustment to various physiological and sensory balance characteristics in senior persons living at an old age home. Psychological factors (old-age adjustment)

Need of the Study

Elderly individuals in old age homes often face physical, physiological, and psychological challenges due to inactivity and isolation. There is a growing need for simple, low-cost interventions that can enhance mobility, health, and mental well-being. The Pawanmuktasana Series offers a holistic yogic approach that may improve joint function, respiratory health, and emotional stability. However, limited research exists on its integrated effects in institutionalized elderly. This study seeks to fill that gap and support yoga-based interventions for healthy aging.

Statement of the Problem:

The purpose of the study is to examine the effect of the Pawanmuktasana Series on selected physical, physiological, and psychological variables among elderly individuals residing in old age homes in Gwalior.

Objectives of the Study:

1. To determine the effect of the Pawanmuktasana Series on range of motion among elderly individuals.
2. To assess the effect of the Pawanmuktasana Series on balance and proprioception in elderly individuals.
3. To evaluate changes in coordination and lumbar flexion following the Pawanmuktasana Series.
4. To investigate the impact of the Pawanmuktasana Series on systolic and diastolic blood pressure.
5. To examine changes in oxygen saturation and forced vital capacity (FVC) after the intervention.
6. To analyse the impact of the Pawanmuktasana Series on old age adjustment.

Research Questions:

1. Does the Pawanmuktasana Series improve physical functions such as range of motion, coordination, and balance in elderly individuals?
2. Does the Pawanmuktasana Series positively influence physiological variables like blood

pressure, oxygen saturation, and FVC?

3. Does the practice of the Pawanmuktasana Series enhance psychological well-being, specifically in terms of old age adjustment ?

Delimitations:

1. The study will be limited to 60 elderly males and females aged 50–65 years residing in old age homes in Gwalior.
2. The duration of intervention will be 12 weeks, with sessions held three times a week.
3. The study will be confined to the following variables:

   Physical: Range of motion, balance, proprioception, coordination, and lumbar flexion

   Physiological: Systolic & diastolic blood pressure, oxygen saturation, forced vital capacity (FVC)

   Psychological: Old age adjustment.
4. Only the Pawanmuktasana Series (Groups 1, 2, and 3) as defined by Swami Satyananda Saraswati will be used as the intervention.

Hypotheses:

1. There will be no significant difference in range of motion between the control and experimental groups post-intervention.
2. There will be no significant difference in balance and proprioception between the control and experimental groups.
3. There will be no significant difference in coordination and lumbar flexion after the 12-week intervention.
4. There will be no significant difference in systolic and diastolic blood pressure between the control and experimental groups post-intervention.
5. There will be no significant change in oxygen saturation and FVC between the two groups.
6. There will be no significant difference in old age adjustment between the control and experimental groups.

DESCRIPTION OF THE TERMS

1. Pawanmuktasana series
2. Pawanmuktasana series and physical variables
3. Pawanmuktasana series and physiological variables (systolic and diastolic blood pressure, oxygen saturation, and forced vital capacity (FVC).)
4. Pawanmuktasana series and psychological variables

1. Pawanmuktasana series

The three progressive groups of the Pawanmuktasana series, as described by Swami Satyananda Saraswati, are intended to improve overall well-being and target certain body parts, particularly in older people or those with restricted mobility. The first group, referred to as the Anti-Rheumatic Group, is focused on reducing stiffness throughout the body and relaxing joints. Simple motions like bending the toe, rotating the ankle, bending the knee, moving the wrist and fingers, and rotating the shoulders and neck are all included. Particularly helpful for people with arthritis or sedentary lives, these exercises are designed to increase circulation, improve joint mobility, and lessen discomfort or stiffness.

The Digestive or Abdominal Group is the second group, and its purpose is to strengthen the muscles in the abdomen and to stimulate the digestive system. It includes poses like Udarakarshanasana (abdominal twisting stance), Chakki Chalanasana (churning the mill), Nauka Sanchalanasana (rowing pose), and Supta Pawanmuktasana (wind-relieving pose). Along with toning the abdominal area and improving digestion and metabolic function, these motions also help reduce gas, constipation, and bloating.

The third group, called the Energy Block Release Group or Shakti Bandha Asanas, focuses on the body's deeper energy pathways and blockages, especially those surrounding the spine and pelvis. It involves advanced variations of rowing and mill-churning positions, as well as techniques like Setu Bandhasana (bridge pose) and Marjari Asana (cat-cow stretch). These poses improve the flow of prana (life energy), ease physical and energetic strain, and strengthen the nerve system. All things considered, the three Pawanmuktasana series promote digestive effectiveness, joint health, and energy balance, providing a thorough basis for more

complex yoga techniques. Saraswati, S. S. (2008).

2. **Pawanmuktasana series and physical variables (include range of motion, static balance, proprioception, coordination, and lumbar flexion)**

Three progressive groups—Anti-Rheumatic Group, Digestive/Abdominal Group, and Shakti Bandha Asanas—make up the Pawanmuktasana series, which was created by Swami Satyananda Saraswati. Each group greatly improves physical attributes like range of motion, static balance, proprioception, coordination, and lumbar flexion. By promoting the generation of synovial fluid and strengthening neuromuscular control, joint-loosening exercises like ankle rotation, knee bending, and shoulder rotation assist increase range of motion and proprioceptive awareness. The Digestive/Abdominal Group includes poses like Chakki Chalanasana and Nauka Sanchalanasana, which strengthen the core and spine and improve lumbar flexion and coordination through rhythmic, controlled activities, even though their primary focus is gastrointestinal health.

Through postures like Setu Bandhasana and Marjari Asana, which are useful for improving static balance and deep postural muscle activation, the Shakti Bandha Asanas concentrate on energy block release and spinal-pelvic alignment. When combined, these shows provide a comprehensive and approachable method of physical training that is particularly advantageous for senior citizens, promoting functional independence, preventing falls, and preserving mobility (Saraswati, 2008).

3. Pawanmuktasana series and physiological variables (systolic and diastolic blood pressure, oxygen saturation, and forced vital capacity (FVC).

Systolic and Diastolic Blood Pressure: The Anti-Rheumatic Group promotes improved cardiovascular health by influencing blood circulation in addition to joint mobility and flexibility. By encouraging blood flow and lowering vascular resistance, regular repetition of these exercises can help lower systolic and diastolic blood pressure. These motions' rhythmic quality, when paired with mindful breathing, helps trigger the parasympathetic nervous system, which lowers blood pressure and reduces stress.

Oxygen Saturation: The respiratory system is immediately impacted by the Digestive/Abdominal Group, which includes postures like Supta Pawanmuktasana (wind-relieving stance) and Nauka Sanchalanasana (rowing pose). By strengthening the diaphragm and abdominal muscles, these motions encourage deeper and more effective breathing, which raises oxygen saturation levels by expanding the lungs and improving oxygen exchange efficiency.

Forced Vital Capacity (FVC): By strengthening the spine and core muscles, the Shakti Bandha Asanas support lung function and FVC. These postures can assist in expanding lung capacity and improving respiratory system efficiency, which will improve total oxygen utilization by encouraging deeper breathing and better posture. **Naga Kishore, R. et.al (2023)**

4. Pawanmuktasana series and psychological variable (old age adjustment)

The holistic approach of the Pawanmuktasana series addresses both physical and mental aspects of health. By reducing physical tension and promoting mindfulness, these practices can alleviate symptoms of neurosis. The integration of breath and movement helps regulate the nervous system, which leads to reduced stress and improved emotional balance. As people age, they frequently face challenges related to physical health, social roles, and emotional well-being. Regular practice has been associated with Bonura, K. B., et al. (2014).

CHAPTER 2
LITERATURE REVIEW

1. **Chaitra P et al. (2023)** A Comparative Study on Oxygen Saturation, Breath Rate, Lung Parameters, Anxiety, and Depression Levels in Geriatric Populations looked at the effects of yoga practices vs traditional activities. The selection criteria resulted in 40 participants participating in group therapy. The yoga group got yogic relaxation and pranayama (10 minutes each), whereas the exercise group received supine rest and diaphragmatic breathing (10 minutes each) for three months, four days per week. Outcome metrics were assessed before and after three months of participation. In pre- and post-assessments, oxygen saturation levels in the yoga group were 96.4±1.39 and 97.05±1.19, respectively, whereas in the exercise group they were 96.7±1.45 and 97.7±0.73. After 3 months, the yoga group's average breath rate was 19.1, and the exercise group's average was 19.65. The yoga group's mean vital capacity (L/min), FEV1 (mL/sec), and FVC (L/min) were 1.72 ± 0.2, 1.53 ± 0.17, and 1.47 ± 0.1, respectively, while the exercise group's mean values were 0.72 ± 0.13, 0.70 ± 0.13, and 0.69 ± 0.13. The mean anxiety and depression scores were 8.9 ± 0.8 & 7.45 ± 0.75, and 9.0 ± 0.72 & 7.9, respectively.

2. **Krishna N. R. (2021).** The study sought to determine the effectiveness of a modified sequence of Pawanmuktasana in increasing back and leg flexibility in inactive women. For the research, 20 sedentary women between the ages of 45 and 55 from Gwalior, Madhya Pradesh (India) were chosen at random. The 20 individuals were then divided evenly into two groups: experimental and control. The experimental group participated in the training programme regularly for twelve weeks (five days per week), whereas the control group received no training. Before administering the training regimen, both groups had pre-tests. The study found no significant difference in leg and back flexibility between the control group and the modified series of Pawanmuktasana practiced daily by sedentary women. A post-test was also conducted after twelve weeks.

3. In their 2018 study**, Simon C. et al.** assessed the hip's range of motion during standard yoga poses, including downward dog, forward fold, warrior 1, warrior 2, crescent lunge,

half-moon, triangle, eagle, tree, and seat. Six respondents had been practicing yoga for over ten years, with 11 reporting at least four sessions per week. Although there were statistically significant variations between the right and left limb ranges of motion in a few. The study reveals specific yoga positions that may place the hip in greater ranges of mobility. Flexion, extension, internal rotation, or adduction are all stances that can put stress on the hip. To our knowledge, this is the first study to assess hip ranges of motion during basic yoga postures. According to the findings of our study, the yoga poses that may cause higher anterior dislocation stresses on the hip include warrior I, warrior II, crescent lunge, triangle, and pigeon.

4. **Camilla Ferreira. (2018**) This study investigates the effects of Yoga Nidra and seated meditation on the mental health of college professors. In addition, the study found that Yoga Nidra and sitting meditation were more successful in lowering anxiety and stress levels among college teachers than the control group. However, in terms of anxiety, the Yoga Nidra intervention appeared to be more beneficial. Yoga Nidra is simple to do, does not need a sitting posture or focus, and appears to improve psychological factors such as anxiety and depression. As a result, it may constitute a therapeutic method with preventative, promotional, and curative properties. However, further research with diverse groups of various ages and vocations is required to better understand the processes by which Yoga Nidra works.

5. SIL P et al., (2016) An investigation of the social adjustment of elderly people in Bengal. The study sought to determine the number of social changes made by elderly Bengalis in several aspects of modern life, as well as to compare them across genders. A total of 50 elderly persons were randomly recruited for the study, with 28 males and 22 women. Their age ranged between 60 and 80 years. This study used social adjustments as criteria. The factors were measured using the Shamsad-Jasbir Old Age Adjustment Inventory (SJOAI, 1995). All statistical analyses were performed with conventional statistical software. This study only considered a degree of confidence of 0.05. The results indicated that Bengal's elderly men and women were below the 50 percentiles (men = 43.21 and women = 36.82) in terms of total old-age social adjustment. Older women were in a worse condition than older males, according to the research (t=3.01), which was

statistically significant (P>0.05). Based on the data, it was found that old age men and women in Bengal had a high level of social adjustment issues, with older women experiencing more problems than older males.

6. **Saraswati Devi and Saraswati kala. (2015)** investigates the impact of Yoganidra and Shirodhara on hypertensive patients. The study included 32 hypertension patients aged 30-60 years who were randomly recruited from the Polyclinic at Dev Sanskriti Vishwavidyalaya in Gayatri Kunj, Hardwar, using the accidental sampling approach. In this study, a "Pre-Post Single Group Design" was adopted, with statistical analysis performed using the t-test. The mean systolic and diastolic blood pressure levels were significantly reduced. The study found a substantial drop in systolic and diastolic blood pressure in those who practiced yognidra and Shirodhara ($p<0.001$). The findings show that the hypertension patients' systolic and diastolic blood pressure levels were dramatically lowered.

7. **Tronchon N B et al., (2014) The** prediction of pulmonary restriction caused by forced vital capacity in the elderly is Similar. Using GLI and ERS equations, we evaluated spirometric data in individuals above the age of 85 from our pulmonary function testing laboratory's database. The population with pulmonary limitation was classified as those with a total lung capacity value (TLC) less than the lower limit of normal (LLN) using the ERS'93 equations. The ERS'93 and GLI equations were then evaluated for their ability to detect this when the forced vital capacity (FVC) was less than the LLN. In addition, 285 patients' data were analysed. 66 patients (23%) had a true restrictive defect. The sensitivity to identify a lowered TLC was greater when estimated using the GLI than the ERS'93 equations (70 vs 45%). In contrast, specificity was lower (74 vs 89%, respectively), but there was no change in negative predictive value (89 vs 84%). Using receiver operating curves, both equation sets performed equally in detecting spirometric limitation. In conclusion, both sets of equations predicted pulmonary limitation in older patients. The significant negative predictive value of the GLI equations enables for static

lung volume measurement to be avoided in older patients when the FCV exceeds the LLN, regardless of the anticipated equation utilized.

8. **Chaudhari K S et al., (2013)** The impact of long-term yoga practice on sleep quality and quality of life in the elderly was investigated in a study to evaluate the effect of long-term yoga exercises on sleep quality and quality of life (QOL) in the elderly. Data were collected from elderly people aged 60 years or more living in Nagpur city using two types of survey questionnaires: Pittsburgh sleep quality index (PSQI) and QOL Leiden-Padua (LEIPAD) Quest. The study was cross-sectional in nature. The study comprised 65 older men and women who signed informed consent forms and completed questionnaires. Sleep Quality Score The PSQI and QOL (LEIPAD Questionnaire) scores of the study group were assessed and compared to the control group using the Mann-Whitney U test. The total PSQI score in the Yoga group was lower than that of the control group. Also, the Yoga groups had greater QOL scores than the control group. Finally, including regular Yoga activities into senior people's daily routines will assist them attain good sleep quality and enhance their quality of life.

9. **Danucalov M A et al, (2015)** A randomized controlled trial was conducted to examine the effects of combining yoga and compassion meditation on the quality of life, attention, vitality, and self-compassion of family carers of Alzheimer's disease patients. A total of 46 volunteers were randomly assigned to two groups: the yoga group and the compassion meditation group. The 8-week program included three weekly yoga and meditation sessions, each lasting 1 hour and 15 minutes. Scores for quality of life, attentiveness, energy, and self-compassion were taken before and after the intervention. The yoga and compassion meditation program group demonstrated significant improvements ($P < 0.05$) in quality of life, attention, vitality, and self-compassion scores compared to the control group, who showed no significant differences at the post-intervention time-point. The current study's findings imply that an 8-week yoga and compassion meditation program might increase family carers' quality of life, energy, attentiveness, and self-compassion for Alzheimer's disease patients.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter reveals all the methods and procedure of the whole research work to be conducted. This significant chapter being the backbone of the research work reveals major measures, viz, collecting the data with the help of research design and use the suitable statistical technique, subjects treated and non-treated and so on

Selection of the subjects

Subjects from the study will be selected from elderly people who live in old age home, Gwalior. Sample size shall be {n=60} which is further divided into two groups experimental and control group

Group	Sample size	Training
Experimental	30 subjects	Pawanmuktasana series
Control	30 subjects	No intervention given

Selection of variables

1. **Independent variable** –Pawanmuktasana series.
2. **Dependent variable**:
    1. **Physical variables**: Range of motion, Static Balance, Proprioception, Coordination, Lumber flexion.
    2. **Physiological variables**: Systolic Blood pressure, Diastolic Blood pressure, Oxygen saturation, Forced vital capacity (FVC).
    3. **Psychological variables**: Old age adjustment.

Criterion Measures

Physical variables

They will be measured by sense balance test software except lumber flexion.

1. Range of motion
2. Static balance
3. Proprioception
4. Coordination
5. Lumber flexion: - It will be measured by sit and reach test.

Physiological variables:

1. Systolic and Diastolic Blood pressure - It will be measured by manual sphygmomanometer.
2. Oxygen saturation – It will be measured by pulse oxymeter.
3. Force vital capacity (FVC):- It will be measured by Dry Spirometer.

Psychological variables:

1. Old age adjustment: - The standard inventory of old age adjustment by Shamshad Hussain and Jasbir Kaur shall be administered to assess the aforementioned variable. This inventory measures the adjustment of old aged people into six areas—I. Health, II. Home, III. Social, IV. Marital, V. emotional and VI. Financial.) The inventory shall be procured from National Psychological Corporation, Agra

Research design

The present study shall be conducted by incorporating pre- post-test experimental design. The intervention period shall be of 12 weeks for about 20 minutes a day, exposing to the technique for about 3 days a week

Variables	Pre-test	Intervention	Post-test
Range of motion	A1	X	A2
Static balance	B1	X	B2
Proprioception	C1	X	C2
Coordination	D1	X	D2
Lumber flexion	E1	X	E2
Oxygen saturation	F1	X	F2
Systolic Blood pressure	G1	X	G2
Diastolic Blood Pressure	H1	X	H2
Force vital capacity	I1	X	I2
Old age adjustment	J1	X	J2

Administration of test

Pawanmuktasana series, the interventional programme will be administered to the experimental group for 3 days a week for about 12 weeks in total

No such training will be given to the control group. They will act as a passive control group following their normal routine.

Collection of data

Collection of data shall be done with the help of various appropriate equipment and inventories of the concerned **Physical, physiological and psychological variables**. And data collection shall be of two times for both experimental and control group i.e., before the intervention and after the intervention. All the variables shall be assessed at their respective residing locations.

Statistical Technique

1. **One way Ancova** will be used to compare adjusted mean scores of selected physical variable (Range of motion, static balance, proprioception, coordination, lumber flexion) and selected physiological variables (Blood pressure, oxygen saturation, forced vital capacity (FVC)) selected psychological variables (old age adjustment) and of Experimental and control group of elderly people of old age home Gwalior by considering the pre-score of the concerned psychological variables , physiological variables and physical variables as their respective covariates.
2. **Descriptive statistics will be used** to characterize the level of selected physical variables (Range of motion, static balance, proprioception, coordination, Lumber flexion) physiological variables (Blood pressure, oxygen saturation, forced vital capacity (FVC)) and psychological variables (old age adjustment) of elderly people of old age home, Gwalior.

EXPECTED OUTCOME

The present study will be useful for old age people between the ages 50-65 years, residing in an old age home. The current study is relevant because it reveals the effectiveness of the Pawanmuktasana series on specific physical, physiological, and psychological traits in elderly residents of the Gwalior old age home. It is also relevant because it has the potential to address the senior citizens' capacity for adjusting to old age using the Pawanmuktasana sequence.

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